The Impact of Financial Education in High School and College On Financial Literacy and Subsequent Financial Decision Making

by Lewis Mandell
Kermit O. Hanson Visiting Professor of Finance and Business Economics
Foster School of Business, University of Washington
Senior Fellow, Initiative on Financial Security, Aspen Institute

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Abstract:

Many consumers appear to lack the financial literacy needed to make financial decisions in their self-interest. A growing number of analysts and politicians are blaming the intersection of low levels of financial literacy with complex, financially-engineered products for the current economic meltdown and have proposed a number of solutions to this problem. These solutions range from mandatory education in personal finance to required simplification of financial products and greatly increased regulation.

This paper examines evidence on the effectiveness of personal finance education on both financial literacy and financial behavior. If the problem can be solved through education, it is likely to reduce the perceived need to limit choice in the marketplace for retail financial products. If education is shown to be ineffective, the future of financial product innovation and financial engineering may be greatly limited.

Supporting the effectiveness of education in promoting self-beneficial financial behavior is a well-known paper by Bernheim, Garrett and Maki (2001) which linked required high school education in personal finance to higher levels of saving, decades later, in middle age. On the other hand, five national surveys of high school seniors conducted since 2000 by the Jump$tart Coalition (Mandell 2001, 2002, 2004, 2006, 2009b) fail to show that students who have taken a semester-length course in money management or personal finance are more financially literate than those who were not given the education.

This paper is based upon the first national sample of full-time undergraduate college students designed to measure financial literacy and financial behavior. The survey, which was conducted in March, 2008, also asks respondents about the financial education that they received in both high school and college. An advantage of interviewing college students is that they are legally adults, who must make many of their own financial decisions. A second advantage is that their ability to recall coursework related to personal finance is likely to be better now than later in life.

The paper concludes that there is little evidence showing that full-time high school (or college) courses in personal finance increase financial *literacy*. However, there is compelling evidence that such courses improve financial *behavior*. These finding may help reconcile the results of the Jump$tart surveys and those of Bernheim, Garrett and Maki and justify the continuation of such courses, even though the outcomes, as traditionally measured, are not encouraging.

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Introduction

John Campbell (2006) devoted his 2006 presidential address to the American Finance Association, to a discussion of household finance and the problems of financial literacy. The following statement appears to have anticipated the current sub prime mortgage situation and its ramifications, and begins to separate the problems caused by low levels of financial literacy from those caused by aberrant financial behavior.

> "Even if asset prices are set efficiently, investment mistakes can have large welfare costs for households. Since investment mistakes are particularly likely when new financial markets are created or when households are asked to take on new financial planning responsibilities, they may greatly reduce the welfare gains that can be realized from the current period of financial innovation and from proposed new financial instruments. If household finance can achieve a good understanding of the sources of investment mistakes, it may be possible for the field to contribute ideas to limit the costs of these mistakes. For example, we can try to define the core elements of financial literacy that make it possible for households to undertake financial planning. We can also propose more informative disclosures, structure the customized advice that is offered by financial planning websites, suggest appropriate default investment options, or encourage public provision or tax subsidy of simple financial

products such as well designed U.S. savings bonds. Work of this sort extends the innovative spirit of financial engineering to the retail marketplace. If household finance can achieve a good understanding of the sources of investment mistakes, it may be possible for the field to contribute ideas to limit the costs of these mistakes."

The term "financial literacy" generally refers to the ability of consumers to make financial decisions in their own best interests in both the short and long-term. Low levels of financial literacy have been blamed, in part, for poor mortgage choices made by many Americans of limited means which contributed to the recent meltdown in the US and worldwide banking systems. In addition, the lack of financial literacy has probably contributed to low or even negative rates of personal savings.

As Campbell notes, the need for financial literacy has been enhanced by the increased complexity and proliferation of financial products. Other changes in our society, most notably the shift from defined benefit to defined contribution pensions has placed further responsibility on individuals to look out for their own futures.

Effective remedies to the problem of financial literacy are in short supply. Logistically, it is difficult to provide effective education to adults who have to make imminent complex financial decisions. A recent study by Mandell (2008) shows that few employers are motivated to provide effective and disinterested financial education at the workplace.

Many people have consequently come to feel that personal finance should become part of the basic education of all students. This suggested mandate was made by the National Association of State Boards of Education (2006) and reiterated by the recent report of the

President's Council on Financial Education (2008) whose first recommendation is to "Mandate financial education in all schools for students in grades Kindergarten through 12**."** As of November 2008, 3 US states required at least 1 semester devoted to personal finance and 17 additional states required instruction in personal finance to be incorporated into other subject matters (Jumpstart Coalition, 2008).

To date, most mandated instruction in personal finance appears to be at the high school level. The rationale is that students completing high school are on the verge of adulthood and many have made or are making important financial decisions such as the choice of credit cards, auto insurance and student loans. The recent turmoil in the student loan market was similar to, but of lesser magnitude than that involving sub prime mortgages and suggests that many young people had little or no understanding of the contracts they undertook and may have been misled by those that they trusted.

Of equal importance is the fact that high school is the last opportunity society has to mandate required education for students. Few college-age students opt to take courses in personal finance, even when they are available and many students do not attend college at all.

Since the 1997-98 academic year, the Jump$tart Coalition for Personal Financial Literacy has run large-scale, national, pencil and paper surveys of high school seniors every other year to measure financial literacy. A total of 22,984 students has participated in the 6 surveys. Scores on the standard, 31-question, age-appropriate, multiple choice (four possible answers) exam have never exceeded 60 percent and, in 2008, fell to a low of 48.3 percent. Making matters worse is the finding that full-semester high school classes devoted to teaching personal finance or money management have *not* been shown to have a significant positive impact on financial literacy scores.

These findings, on the five most recent national studies, clash with the well-known finding by Bernheim, Garrett and Maki (2001) that high school classes in personal finance are related to increased saving in middle age. From a policy perspective, the Jump$tart findings seriously question the usefulness of mandates to teach financial literacy to all students. In fact, Lauren Willis (2008) cites the Jump$tart findings in her paper "Against Financial Literacy Education" to conclude that "the search for effective financial literacy education should be replaced by a search for policies more conducive to good consumer financial outcomes."

It should be noted that although high school courses have not yet managed to increase financial literacy, there is some evidence that courses taught by trained teachers using a well-structured, mandated curriculum, may have a positive impact. In her recent dissertation, Peng (2008) finds that state mandates requiring a specific personal finance course have a significant and positive impact on student financial literacy even though mandates that require testing of personal finance knowledge before graduating from high school do not have this result.

The question posed in this paper is whether financial literacy education, in high school or in college, increases an individual's ability to make better financial decisions. This is not a trivial question. In the current political and economic environment the answer to this question will determine far more than the deployment of scarce educational resources to yet another mandated subject area. Rather, much of the future of finance, financial markets and financial engineering are based on the perceived educability of the American consumer.

In additional to Professor Willis, many behavioral economists and liberal think tanks favor a reversion to a limited number of simple financial products, similar to those that

existed prior to the elimination of Regulation Q. These may include a single home mortgage (i.e.: 30 year, fixed rate, 20 percent down, no pre-payment penalty) and a mandated 401(k) with a pre-determined asset allocation based on age. The use of derivatives to enhance mutual fund returns would likely be banned and alternative investment instruments, such as hedge funds and private equity, would almost certainly be heavily regulated and put off limits to most consumers. If Professor Campbell is correct, a great deal of the creativity of financial engineers will be shifted into structuring retail products that are impervious to consumer mistakes.

A Review of the Evidence Relating to Financial Literacy

Since the mid-1990s, surveys have demonstrated that American youth and adults lack the basic knowledge needed to make good financial choices (see Chen and Volpe, 1998 and Volpe, Chen and Liu 2006 for a review). The lack of basic financial literacy has been shown to result in poor financial decision making. Citing a Nellie May report, Murray (2000) states that 25 percent of undergraduate college students have four or more credit cards and about 10 percent carry outstanding balances between $3,000 and $7,000.

Garman, Leech and Grable (1996) and Joo and Grable (2000) have found that poor financial decisions can hurt productivity in the workplace. Volpe, Chen and Liu surveyed corporate benefit administrators who identified basic personal finance as a critical area in which employee knowledge is deficient and recommended educational programs that focus on improving knowledge of basic personal finance.

Lusardi and Mitchell (2006) used the 2004 US Health and Retirement Study (HRS) to test basic financial knowledge of adults over the age of 50. They developed questions related

to an understanding of interest compounding, the effects of inflation, and risk diversification and found that financial illiteracy is widespread and particularly severe among females, the elderly, and those without much education. These results were particularly surprising since most respondents over age 50 have had experience with bank accounts and credit cards, and have taken out at least one mortgage.

A study by the OECD (2005) and the work by Lusardi and Mitchell review the evidence on financial literacy across countries and show that financial illiteracy is common in many other developed countries, including European countries, Australia, Japan and Korea. These findings are not unlike those found by Christelis, Jappelli and Padula (2006), who use micro data from European countries which are similar to the HRS data in the U. S., and finds that most respondents in Europe score low on financial literacy scales.

Financial Literacy and Financial Behavior

Financial literacy has been positively related to self-beneficial financial behavior in some studies. For example, Hilgert, Hogarth and Beverly (2003) formed a "Financial Practices Index" based upon self-benefiting behavior in cash-flow management, credit management, saving and investment practices. When they compared the results of this index with scores on a financial literacy quiz, they found a positive relation between financial literacy scores and Financial Practices Index scores. Their results suggest that financial knowledge is related to self-beneficial financial practices.

Van Rooij, Lusardi and Alessie (2007) found in a study of Dutch adults that those with low financial literacy are more likely than others to rely on friends and family for financial advice and are less likely to invest in stocks. Using the 2006 Jump$tart survey,

Mandell (2006a) found that high school seniors who never bounced a check or who balanced their checkbook had substantially higher financial literacy scores than others with checking accounts.

Financial Education and Behavior

While financial *behavior* seems to be positively affected by financial literacy, the effects of financial *education* on financial behavior are less certain. Bernheim, Garrett and Maki (2001) found that those who took a financial management course in high school tended in middle age to save a higher proportion of their incomes than others. On the other hand, Mandell (2006b) found little positive impact of a well-regarded high school personal finance course on objective, post-high school financial behavior from 1 to 5 years after taking such a course and also found that self-beneficial behavior did *not* improve with increased age and presumed greater experience.

Danes (2004) measured changes in subjectively-reported financial behavior immediately after and again, three months after high school student exposure to the part-semester personal finance curriculum supplied to teachers by the National Endowment for Financial Education (NEFE). She reported positive change. By contrast, a multivariate analysis of high school seniors included in the 2006 Jump$tart survey who bounced a check, finds that while financial literacy scores, race and aspiration are significant determinants of such non-self-beneficial behavior, financial management education has no effect (Mandell, 2006a).

It is useful to note that high school programs designed to change or modify behavior in other important areas have been no more successful than those related to financial literacy.

For example, a meta analysis by DiCenso, Guyatt and Griffith (2002) found that educational interventions designed to reduce unwanted pregnancies among adolescents did not delay initiation of sexual intercourse among young women or young men or reduce pregnancy rates among young women.

Studies of adult behavior modification education also produce results with mixed outcomes. The efficacy of retirement education through retirement seminars has been studied by a number of scholars with mixed results. Bayer, Bernheim and Scholz (2006) found that employer retirement seminars increased both participation in and contributions to voluntary savings plans. Lusardi and Mitchell (2006) found that retirement seminars have a positive wealth effect, but mainly for those with less wealth or education. Duflo and Saez (2003) found retirement seminars to have a positive effect on participation in retirement plans, but also found the increase in contributions to be negligible. Choi, Laibson, Madrian and Metrick (2006) and Madrian and Shea (2001) found participants in retirement seminars to have much better intentions than follow-through.

Outside of retirement planning, Elliehausen, Lundquist and Staten (2003) found that credit counseling tended to improve borrowing behavior and improve creditworthiness. Hirad and Zorn (2001) found that pre-purchase counseling programs for those about to buy a home decrease delinquency rates.

Determinants of Young Adult Financial Literacy

Demographics

Table 1 summarizes the results of five Jump$tart surveys of financial literacy by various demographic and aspiration variables. Only recently have students from families

with higher incomes tended to do better than others on the exam, making the relationship between income and mean financial literacy scores monotonic. However, family income, per se, tends to be a weak predictor of financial literacy. Whenever financial literacy scores are regressed on family income and a number of other explanatory variables, income shows no significant relationship to financial literacy.

There is also a strong and monotonic relationship between financial literacy scores and parents' education. The average score in 2008, if neither parent completed high school, was 44.2 percent. This increased to 51.8 percent for those who had at least one parent who completed college. In addition, while just 1.6 percent of those whose parents had less than a high school education scored a C or better on the exam (at least 75 percent), 7.5 percent of those with parents in the highest education category did this well.

The surveys have found little difference in financial literacy by gender. In 2008, males did marginally better than females (49.0 percent versus 47.9 percent) as they did in 2000, 2004 and 2006. However, in two of the six surveys (1997 and 2002), females did slightly better than males.

Differences in financial literacy appear to be more closely related to race than any other demographic variable. White students have consistently outperformed all others while African Americans and Native Americans have tended to do least well. The difference of more than 10 points in financial literacy scores between whites and African Americans represents a 20% differential.

Results by Aspirations

Students were asked about their educational plans and occupational aspirations as well as the full-time income they anticipated making from their first job. The results are shown in Table 2. Jump$tart surveys have found consistently that students who expect to attend a four-year college, those who intend to become professionals and those who expect to have a higher starting salary tend to do much better than others in financial literacy.

In 2008, for the first time, The Jump$tart survey asked students about their college entrance exam scores. This had been suggested by Professor Shawn Cole at Harvard who hypothesized that the problem-solving ability evidenced by performance on the Jump$tart tests of financial literacy might be measuring overall intelligence. The results, at the bottom of Table 2, appear to support this conjecture.

Results by Money Management Education

Table 3 summarizes results from the five surveys (2000 through 2008) that have included a question about courses related to financial literacy that the student may have taken. In four of the surveys, including the 2008 survey, students who took a full semester course in money management or personal finance actually had slightly *lower* mean financial literacy scores than all students. In 2008, for example, the 21.4 percent of high school seniors who reported having had an entire course in money management or personal finance scored an average of 47.5 percent on the exam in contrast to the average score of 48.3 percent achieved by all students. While the differences are not large enough to support a statistical conclusion that students who have had such a course are *less* financially literate

than those who have not, there is no evidence to show that courses in money management or personal finance, as they are now taught, improve the financial literacy of their students.

Survey of Teachers and Schools

The finding that high school classes in financial management or personal finance are ineffective in raising levels of financial literacy elicited a number of hypotheses to explain this phenomenon. The first was that students who opted to take such classes were less likely to be academically talented and college-bound. This was disproved by 2002 Jump$tart data (Mandell, 2002) showing no differences in the proportions of college-bound and non-college-bound students taking such a class.

A second hypothesis was that teachers of financial management or personal finance were not very well trained to teach in this area. However, a survey of participating schools conducted as part of the 2004 Jump$tart survey (Mandell, 2004) found that teachers who taught full time courses in money management or personal finance tended to be well-educated in the area and experienced. More than 90 percent of schools used the same teachers to teach these full semester courses year after year, two-thirds of whom had a graduate degree in business, consumer economics or related fields. Nearly all of these teachers were shown to have had at least an undergraduate degree in the appropriate field.

A third hypothesis was that many students took the course as an elective rather than as a required course and did so because it was structured to be easier than required courses and, consequently, did not teach the material with equivalent rigor. In fact, students who took a *required* course in money management or personal finance did better than all other students (54.2 percent as compared to 52.3 percent) on the financial literacy test, perhaps

because required courses are taken more seriously However, just 6 percent of all US high school students were required to take such a course in 2004.

It was surprising to learn from the 2008 survey that nearly half the students who took a course in personal finance or money management were freshmen, sophomores and juniors rather than seniors who could presumably gain the most from it. .

Success of Stock Market Games

The stock market game is the only school-based educational program that is consistently related to higher financial literacy scores. Starting with the 2000 Jump$tart survey, when it was first measured, students who play a stock market game in class do 3 to 4 percentage points better than all students. On a mean score base at about 50 percent, this translates to a 6 to 8 percent increase in financial literacy. Although reasons for the success of this activity are not clearly known, playing such an interactive game appears to stimulate general interest in personal finance. The survey results show that students who played a stock market game in class tend to outscore the average in every subject category, not just in areas related to savings and investments.

Motivation to be Financially Literate

The possibility exists that courses in money management do not improve financial literacy because students don't realize how important this material is to their futures. To test this hypothesis, the 2006 Jump$tart survey added three new questions to see how young adults felt about three issues; the importance of one's own actions in avoiding financial distress, the degree of discomfort caused by the financial inability to pay one's bills; and the perceived difficulty of retiring without a pension (other than Social Security) or savings.

Slightly more than two-thirds of the students attributed personal financial difficulty to the consumer's personal actions, largely to too much credit (28.9 percent) and no financial plan (also 28.9 percent). An additional 9.4 percent felt that the greatest cause of financial difficulty was not enough savings. Only 8.6 percent of students felt that "bad luck" was the greatest cause of financial difficulty and those students had average financial literacy scores that were well below average. The best financial literacy scores were recorded by students who felt that the greatest cause of financial distress was buying too much on credit (56 percent) and those who felt that it was due to the lack of a financial plan (53.8 percent).

The second motivational issue relates to the fact that some young people may not regard financial distress and insolvency as being particularly bad or unusual in today's society. Perhaps most of their acquaintances are also from over-consuming, credit-dependent families who have adjusted to unpaid bills and calls from credit collectors. However, only 8.5 percent of students feel that it is not so bad if you can't pay your bills and these tend to have very low financial literacy scores, averaging just 43.2 percent.

The third motivational issue was addressed by asking students how hard it is to survive in retirement entirely on Social Security. Just 7.5 percent responded that one could "live well" on Social Security, and their financial literacy scores were very low, just 39.9 percent. About half the students felt that it was tough to retire on Social Security alone, and they had the highest scores (56 percent). The remaining 42.3 percent of students took the middle view that people could get by on Social Security if they were willing to cut back on expenses and their average financial literacy score was 50.4 percent.

Mandell and Klein (2007) found, in a regression analysis that after controlling on all other important variables, such as aspiration, the three motivational variables had significant

and positive relationships to financial literacy. The addition of these variables added about a third to the explanatory power of the regression. This suggests that the effective teaching of money management and personal finance involves continual emphasis on the importance of financial literacy to students' own futures.

Possible Explanations for the Differences Between Jump$tart Results and Those of Berheim, Garrett and Maki

In a recently-published article, Mandell (2009) speculated at to why his results appeared to differ so dramatically with those of Bernheim, Garrett and Maki who found that mandated high school instruction on topics related to household financial decision making resulted in increased asset accumulation once the exposed students reached middle age. The first hypothesis is that some of what students learn (and promptly forget) in high school may lie dormant for many years, materializing only when, as adults, they have sufficient resources to utilize what they learned. This may explain the authors' findings that the effects are gradual and are probably due to implementation lags. These findings are similar to those of Currie and Thomas (1995) who found positive long term effects of the Head Start, pre-school program for economically disadvantaged children which may not be apparent for nearly 20 years.

A second hypothesis is that the respondents included in the survey analyzed by Bernheim, Garrett and Maki graduated from high school between 1964 and 1983 when many fewer families had much discretionary income, when the parents of these students may have lived through the difficult years of the Depression and World War II and when the proliferation of easy-to-use debt vehicles, such as credit cards, had not yet begun. If the

importance of saving was stressed at home, it is possible that it was much easier to reiterate effectively at school. Today, when aggregate consumer savings rates are zero or below, a consumer-oriented culture may be much more difficult for teachers to overcome.

Given the conflicting results and the important policy implications of these studies with respect to the effectiveness of high school financial education, Mandell concluded, additional studies on adults who graduated from high school in the past two decades would be very useful.

The 2008 Jump$tart College Survey

In early 2008, for the first time, the Jump$tart financial literacy survey was administered to college students. A sample of 1,030 full-time college students was drawn for this survey by Survey Sampling International from their large, nationwide panel of compensated participants. The survey was administered online.

The 2008 college survey was identical to the 2008 high school survey in terms of the 31 question financial literacy test and the standard demographic questions. However, since nearly all college students are legally adults and capable of utilizing a wide variety of financial products, we were able to measure far more of their financial behavior than we were able to measure for high school students. In addition, we were able to ask them questions about financial education that they received in both high school and college to see how they related to both financial literacy and to financial behavior.

Table 4 shows that financial literacy is strongly and monotonically related to level of education. For example, college freshmen have average scores of 59.3 percent on the 31-question Jump$tart test in contrast with 48.3 percent for high school seniors. Some of that difference is almost certainly due to the fact that enrollment is college is self-selective and

that those who enroll tend to be more gifted academically than those who don't. However, scores continue to improve through the senior year in college where the mean of 64.8 percent makes the average college student appear to be on the verge of financial literacy.

This, in itself, is an important finding. Since it is difficult to teach students aged 18 and below how to use financial instruments that they will encounter in adulthood, probably in a different form, many experts feel that financial literacy really involves the ability to solve problems and do research. These are skills that are taught in college, regardless of field. Hogarth, Gorin and Bell (2008), of the Board of Governors of the Federal Reserve, worked with military personnel at an army base and found that poor financial decisions varied inversely with levels of education to the point where few college graduates tended to make any serious mistakes.

A second important finding from Table 4 is that college students who had taken a full-semester high school course in money management or personal finance did worse in the financial literacy test than did their cohorts in every year of college. This certainly does not support the value of such a course in high school in equipping adults to be more financially literate. Finally, as we found in high school, playing a stock market game significantly increases the financial literacy of college students.

What about financial education in college? Table 5 shows that college students who have taken a semester-length course in personal Money Management or Personal Finance in college are less financially literate than those who have not taken such a course. However, those who have taken a full semester course are more financially literate than those who have taken a portion of such a course, including those who have taken it as part of freshman orientation.

Students who have taken a full semester of economics in college (63.2 percent right) do better than average (62.2 percent), and students who have taken a course in finance (64.6 percent) or accounting (65.4 percent) do better yet.

The most financially literate college students tend to be those who study science, social science or engineering, rather than those who study business or economics. This appears to indicate that financial literacy is more closely related to problem-solving ability than to educational content.

Table 7 regresses financial literacy scores of college students on a number of demographic and financial education variables to see which are most closely related. Females and Whites, as well as those with higher educational aspirations and more years of college have higher financial literacy scores. Educationally, those who played a stock market game in high school as well as those who took a college accounting course had higher financial literacy scores. When a college course in finance or a college course in economics are substituted for the college course in accounting (multicollinearity prevents their being run together), neither has a significant effect on financial literacy.

Perversely, the regression shows that college students who took a full semester high school class in personal finance or money management are significantly *less* financially literate than others. Since the demographic characteristics of college students who took such a course in high school are similar to those of students who did not take such a course (and are further controlled for by demographic variables in the regression), the negative sign on the coefficient is extremely difficult to understand.

Financial Behavior of College Students

Tables 8 through 13 examine the impact of financial education in high school and college on seven measurable financial behaviors of college students:

- Credit card payment behavior (Table 8a and b)
- Incidence of late payment of credit cards (Table 9a and b)
- Incidence of bouncing checks (Table 10a and b)
- Checkbook balancing (Table 11a and b)
- Perceived adequacy of savings and investments (Table 12a and b)
- Preparation of income taxes (Table 13a and b)

High school courses in money management appear to improve behavior in terms of credit card payment behavior, timely payment of credit card bills, check bouncing, checkbook balancing, perceived adequacy of savings and debt worrying behavior. A college course in money management appears to improve behavior in terms of credit card payment behavior, timely payment of credit card bills and checkbook balancing but not the other 4 items.

Table 14 shows the results of 6 binary logit regressions that attempt to explain the financial behavior of college students. Four of the behaviors ("always pays credit card balance," "never late paying credit card," "never bounced a check," and "savings are adequate") were thought to relate to the use of debt to finance the student's education so a variable measuring the anticipated student debt at graduation was added to control on this factor.

First, with the exception of the control variable "student debt at graduation," which was, as predicted, negatively related to the four debt-dependent variables, there seemed to be no consistent determinant of financial behavior. Second, those who took a full semester high school course in personal finance or money management were significantly more likely to never bounce a check and to feel that their savings were adequate. In other words, even though the high school course did not increase financial *literacy* (and may have even made it worse), it appeared to improve certain types of financial behavior.

In Table 15, the six positive financial behaviors displayed in Table 14 were formed into a simple additive index, ranging from 0 to 6, and regressed upon the possible explanatory variables. The purpose of forming an index is to aggregate financial behaviors in order to see whether we can say anything in general about the determinants

Table 15 shows us that financial behavior is strongly and positively related to a full semester high school class in personal finance or money management. It is *not* related to any courses taken in college. Consistent with previous studies, financial behavior is positively related to financial literacy.

Summary and Conclusions

With few exceptions, financial management or personal finance courses taken in high school or college seem to have little positive impact on the financial *literacy* of college students. They do, however, appear to have a positive impact on at least some areas of financial *behavior*, leading, to a possible reconciliation between the Jump$tart findings and those of Bernheim, Garrett and Maki who found that such a course contributed to higher savings rates decades later in middle age. How can this be?

One hypothesis is that much of the course content is not perceived by the high school students (half of whom are freshmen, sophomores and juniors) as being relevant to their immediate futures and may be promptly forgotten, not unlike a course in trigonometry. However, unlike trigonometry, a class in personal finance is *personal* and the teacher is likely to stimulate emotions such as the fear of poverty, of running out of money or even of spending more dollars than one has in an account. These emotions may lie dormant until the student has the need and ability to draw upon them. This would explain why students who have had such a course in high school save more of their income in middle age or, even earlier, behave in a more prudent financial manner while they are still in college.

In other words, our tradition of measuring the effectiveness of a course by testing cognitive achievement may not be sufficient for courses whose objective is to influence *future behavior*. Consequently, it would appear to be premature to suggest ending the teaching of personal finance courses to high school students based merely upon the lack of positive impact of these courses on financial literacy scores.

As a final note, it is worthwhile to ponder whether any type or amount of education is sufficient to enable consumers to choose from a wide array of complex, often highly engineered financial products or even to just avoid participating in the next great Ponzi scheme. This study shows that college courses in personal finance, economics, accounting or finance seem to have little impact on financial literacy and none on financial behavior. Recently our most sophisticated commercial and investment banks have placed themselves in great jeopardy by continuing to load up on sub-prime mortgage-backed securities, and institutional investors, including hedge funds, have invested their assets with Mr. Madoff. If our best educated and most sophisticated investors make these errors, it seems unlikely that

education, alone, will prevent consumers from making the “mistakes” described by Professor Campbell at the beginning of this paper.

Table 1
High School Test Results by Background

	1997 Mean Score	2000 Mean Score	2002 Mean Score	2004 Mean Score	2006 Mean Score	2008 Mean Score	2008 % of Students	2008 % C or Better	2008 % Failing
	57.3%	51.9%	50.2%	52.3%	52.4%	48.3%	100%	4.7%	73.9%
Parents' Income									
Less than $20,000	55.2	46.3	45.7	49.5	48.5	43.4	10.7	2.2	5.2
$20,000 to $39,999	58.2	52.0	50.7	51.3	50.8	47.3	20.1	2.7	77.9
$40,000 to $79,999	59.6	57.2	52.3	54.1	53.7	50.3	26.5	4.5	70.9
$80,000 or more	59.0	55.0	52.7	55.9	55.6	52.3	23.0	9.5	62.0
Highest Level of Parents' Education									
Neither Finished H.S	51.4	47.0	43.7	44.6	44.5	44.2	11.5	1.6	85.4
Completed H.S.	57.1	49.7	47.5	51.5	50.6	47.2	24.4	3.3	77.1
Some College	55.8	53.8	51.7	52.6	51.8	49.0	21.6	4.5	73.2
College Grad or More	59.3	55.1	53.5	55.4	55.6	51.8	36.8	7.5	65.3
Sex									
Female	57.9	51.6	50.7	52.2	52.3	47.9	55.3	3.8	75.4
Male	56.9	52.2	49.8	52.4	52.6	49.0	44.7	5.8	71.6
Race									
White	60.9	54.5	53.7	55.5	55.0	52.5	55.0	7.1	64.4
African-American	50.4	47.0	42.1	44.0	44.7	41.3	13.6	1.4	89.1
Hispanic American	55.1	45.3	44.8	48.3	46.8	45.1	20.1	2.5	83.4
Asian-American	55.8	53.5	50.6	48.3	49.4	47.2	3.7	1.7	77.2
Native American	48.8	38.6	45.5	46.7	44.1	37.7	2.2	0.5	88.8
Region									
Northeast				56.5	53.8	53.2	6.9	5.7	57.2
Midwest				52.4	54.2	51.7	27.1	6.8	65.1
South				49.9	49.9	47.2	40.1	3.8	77.5
West				52.2	52.8	45.2	25.9	3.7	82.1

Table 2
High School Test Results by Aspirations

	1997 Mean Score	2000 Mean Score	2002 Mean Score	2004 Mean Score	2006 Mean Score	2008 Mean Score	2008 % of Students	2008 % C or Better	2008 % Failing
	57.3%	51.9%	50.2%	52.3%	52.4%	48.3%	100%	4.7%	73.9%
Educational Plans									
No Further Ed	43.8	39.7	32.2	41.9	37.9	34.9	2.2	0.1	97.3
2-year or Jr. College	53.8	43.3	46.4	48.0	47.5	44.6	18.7	1.3	83.4
4-year College	60.0	54.5	53.5	55.0	54.9	50.9	67.2	6.3	68.6
Planned Occupation									
Manual Work	45.5	38.7	39.4	40.0	41.0	36.9	2.8	0.7	91.0
Skilled Trade	55.7	43.6	45.7	47.1	47.8	43.8	6.5	2.9	78.8
Service Worker	54.4	41.3	43.3	49.0	49.5	44.6	12.1	2.7	83.6
Professional Worker	59.6	55.0	53.1	55.2	54.9	51.7	48.6	6.6	66.9
Expected Full-Time Income									
Under $15,000	47.4	40.6	39.0	45.1	42.5	38.5	3.4	3.3	88.8
$15,000 to $19,999	53.3	41.7	46.6	48.8	46.4	42.2	6.7	0.6	88.4
$20,000 to $29,999	58.5	53.4	50.3	51.3	51.6	46.8	10.6	2.2	76.7
$30,000 or more	59.5	54.4	52.6	53.8	53.9	50.7	20.5	6.2	69.3
$40,000 or more*				54.1	54.1	50.2	41.6	5.7	69.8
College Entrance Score									
SAT less than 1,500						45.5	10.4	2.9	81.3
SAT 1,500-2,000						54.1	17.3	7.3	59.5
SAT more than 2,000						52.2	4.3	20.9	56.8
ACT under 20						43.3	10.1	1.5	87.6
ACT 21-26						51.3	17.4	3.8	67.6
ACT 27+						58.8	5.9	17.1	43.9

*$40,000 or more bracket was added in 2004

Table 3
Financial Literacy of High School Seniors
by Money Management Education
2000-2008

Classes in High School	2000	2002	2004	2006	2008
Entire Course, Money Mgt./Personal Finance	51.4	48.2	53.5	51.6	47.5
Part Course, Money Mgt./Personal Finance	52.9	49.8	52.7	53.4	48.9
Entire Course, Economics	51.0	49.8	53.0	53.2	48.8
Portion Course, Economics	52.1	51.1	53.2	53.0	49.4
Stock Mkt. Game in Class	55.1	52.4	55.8	55.0	51.1
ALL STUDENTS	**51.9**	**50.2**	**52.3**	**52.4**	**48.3**

Table 4
Financial Literacy of College Students
by Money Management Education in High School

Classes in High School	ALL	Freshmen	Sophomores	Juniors	Seniors
Entire Course, Money Mgt./Personal Finance	**59.3**	58.7	58.6	58.2	63.1
Part Course, Money Mgt./Personal Finance	**62.1**	58.9	59.4	66.4	64.9
Entire Course, Economics	**62.7**	60.2	62.1	63.4	65.2
Portion Course, Economics	**62.2**	57.1	61.3	63.6	65.5
Stock Mkt. Game in Class	**65.6**	62.3	65.6	67.7	68.3
ALL STUDENTS	**62.2**	**59.3**	**61.0**	**62.1**	**64.8**

Table 5
Financial Literacy of College Students
by Money Management Education in College

Classes in College	Score
Semester-Length Course in *Personal* Money Management or Finance	60.1
Coverage of *Personal* Money Management or Finance (incl. orientation)	58.2
Economics	63.2
Finance	64.6
Accounting	65.4
ALL STUDENTS	**62.2**

Table 6
Financial Literacy of College Students
by Major in College

Major	Score
Arts	59.4
Business or economics	62.4
Engineering	63.3
Humanities	62.1
Nursing	57.1
Science	63.4
Social Science	64.0
Other	60.9
ALL STUDENTS	**62.2**

Table 7
Regression on Financial Literacy Score

	B	Sig.
Constant	.453	.000
Male	**-.037**	**.001**
White	.052	**.000**
Years of College	.017	**.000**
Full Semester HS Money Mgt.	**-.034**	**.020**
Expected Years of Education	.015	**.000**
Played Stock Game in HS	.048	**.000**
College Accounting	.043	**.001**
Adjusted R Squared	.109	

Table 8a
Credit Card Payment Behavior of College Students
by High School Money Management Education

Payments on Credit Cards	ALL	Entire Money Mgt.	Part Money Mgt.	Entire Econ.	Part Econ.	Stock Game	Score
Always pays off monthly	47.6	53.8	48.2	49.1	51.8	51.8	62.7
Generally pays off monthly	16.9	17.5	18.1	17.7	15.5	19.6	62.9
Occasionally pays off monthly	12.9	13.8	13.9	13.4	8.2	10.6	58.9
Seldom pays off but tries to pay down	15.8	10.0	15.7	12.8	21.8	12.6	63.9
Generally pays minimum each month	7.7	5.0	4.2	7.0	2.7	5.5	63.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 8b
Credit Card Payment Behavior of College Students
by College Money Management Education

Payments on Credit Cards	ALL	Entire Money Mgt.	Part Money Mgt.	Econo-mics	Finance	Account-ing	Score
Always pays off monthly	47.6	54.5	41.6	48.0	54.2	54.2	62.7
Generally pays off monthly	16.9	16.7	18.0	18.6	12.0	13.9	62.9
Occasionally pays off monthly	12.9	10.6	19.1	13.0	13.3	11.8	58.9
Seldom pays off but tries to pay down	15.8	12.1	11.2	13.8	14.5	13.2	63.9
Generally pays minimum each month	7.7	6.1	13.5	6.7	6.0	6.9	63.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 9a
Late Credit Card Payment Behavior of College Students
by High School Money Management Education

How Frequently Late Paying Credit Card Bills	ALL	Entire Money Mgt.	Part Money Mgt.	Entire Econ.	Part Econ.	Stock Game	Score
Never	64.8	70.0	66.9	68.7	65.5	69.8	63.5
Once or twice since had credit cards	24.4	20.0	24.1	22.8	21.8	21.1	63.0
Once or twice per year	5.2	5.0	5.4	4.9	6.4	5.0	51.0
More than twice per year	5.6	5.0	3.6	3.6	6.4	4.0	59.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 9b
Late Credit Card Payment Behavior of College Students
by College Money Management Education

How Frequently Late Paying Credit Card Bills	ALL	Entire Money Mgt.	Part Money Mgt.	Econo-mics	Finance	Account-ing	Score
Never	64.8	68.2	64.0	64.4	68.7	72.2	63.5
Once or twice since had credit cards	24.4	25.8	21.3	25.2	21.7	22.2	63.0
Once or twice per year	5.2	4.5	9.0	5.6	4.8	2.1	51.0
More than twice per year	5.6	1.5	5.6	4.8	4.8	3.5	59.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 10a
Check Bouncing Behavior of College Students
by High School Money Management Education

How Often Bounced a Check	ALL	Entire Money Mgt.	Part Money Mgt.	Entire Econ.	Part Econ.	Stock Game	Score
Never	70.9	82.7	72.1	72.6	74.7	72.6	63.0
Once or twice in lifetime	20.8	9.1	21.7	19.3	15.3	19.9	62.1
Once or twice per year	5.7	5.5	2.5	5.3	6.0	3.9	64.8
More than twice per year	2.6	2.7	3.8	2.8	4.0	3.6	50.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	

Table 10b
Check Bouncing Behavior of College Students
by College Money Management Education

How Often Bounced a Check	ALL	Entire Money Mgt.	Part Money Mgt.	Econo-mics	Finance	Account-ing	Score
Never	70.9	67.8	70.3	68.6	63.0	69.9	63.0
Once or twice in lifetime	20.8	20.0	21.1	22.0	28.0	22.6	62.1
Once or twice per year	5.7	10.0	6.3	7.1	6.0	5.4	64.8
More than twice per year	2.6	2.2	2.3	2.3	3.0	2.2	50.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 11a
Checkbook Balancing Behavior of College Students
by High School Money Management Education

How Often Balance Checkbook	ALL	Entire Money Mgt.	Part Money Mgt.	Entire Econ.	Part Econ.	Stock Game	Score
After every check, deposit and ATM withdrawal	23.3	28.4	26.7	23.6	27.5	22.1	63.0
About once a week	17.1	18.3	20.0	18.2	15.4	19.6	62.2
About once a month	17.4	18.3	17.9	18.8	23.5	18.6	62.8
Several times per year	5.0	4.6	6.3	4.2	4.0	5.0	62.0
Once or twice per year	4.3	2.8	4.6	4.8	4.0	4.6	64.2
Never	32.8	27.5	24.6	30.4	25.5	27.4	62.3
Total	100.0	100.020.0	100.0	100.0	100.0	100.0	62.2

Table 11b
Checkbook Balancing Behavior of College Students
by College Money Management Education

How Often Balance Checkbook	ALL	Entire Money Mgt.	Part Money Mgt.	Econo-mics	Finance	Account-ing	Score
After every check, deposit and ATM withdrawal	23.3	26.4	27.3	23.7	31.0	27.4	63.0
About once a week	17.1	19.8	19.5	18.4	19.0	19.9	62.2
About once a month	17.4	17.6	14.8	19.5	19.0	17.7	62.8
Several times per year	5.0	6.6	3.9	4.8	2.0	3.2	62.0
Once or twice per year	4.3	3.3	3.1	3.7	5.0	4.3	64.2
Never	32.8	26.4	31.3	29.9	24.0	27.4	62.3
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 12a
Perceived Adequacy of Savings of College Students
by High School Money Management Education

Rate Savings and Investments	ALL	Entire Money Mgt.	Part Money Mgt.	Entire Econ.	Part Econ.	Stock Game	Score
Adequate for needs right now	40.6	54.5	45.6	43.6	45.0	43.1	61.3
Slightly less than I should have now	32.4	23.6	32.8	45.0	33.8	31.1	62.1
Much less than I should have now	27.0	22.0	21.6	43.1	21.3	25.8	63.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 12b
Perceived Adequacy of Savings of College Students
by College Money Management Education

Rate Savings and Investments	ALL	Entire Money Mgt.	Part Money Mgt.	Econo-mics	Finance	Account-ing	Score
Adequate for needs right now	40.6	39.2	40.0	44.6	41.6	45.8	61.3
Slightly less than I should have now	32.4	36.1	34.3	30.7	32.7	28.1	62.1
Much less than I should have now	27.0	24.7	25.7	24.7	25.7	26.0	63.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 13a
Who Prepares Taxes of College Students
by High School Money Management Education

Who prepares your income taxes?	ALL	Entire Money Mgt.	Part Money Mgt.	Entire Econ.	Part Econ.	Stock Game	Score
I do it myself by hand	12.4	11.4	11.9	13.0	10.1	11.6	63.8
I do it myself by computer	19.7	20.3	20.6	20.4	23.4	17.9	65.0
Tax preparer	21.3	22.8	23.0	21.2	23.4	22.2	62.0
My parents	46.5	45.5	44.4	45.5	43.0	48.3	60.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 13b
Who Prepares Taxes of College Students
by College Money Management Education

Who prepares your income taxes?	ALL	Entire Money Mgt.	Part Money Mgt.	Econo-mics	Finance	Account-ing	Score
I do it myself by hand	12.4	17.3	7.2	13.6	14.3	12.8	63.8
I do it myself by computer	19.7	22.4	20.1	24.7	24.8	26.7	65.0
Tax preparer	21.3	21.4	25.2	21.5	25.7	24.6	62.0
My parents	46.5	38.8	47.5	40.2	35.2	35.9	60.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	62.2

Table 14
Binary Logit Regressions on Financial Behavior

	Always Pays CC Balance		Never Late Paying CC		Never Bounced a Check		Balances Checkbook Monthly		Prepares Own Taxes		Savings Adequate	
	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.	B	Sig.
Constant	-.154	.669	.063	.866	.687	.034	.140	.649	-.757	.016	-.727	.023
Male	.293	.137	.175	.398	.124	.495	-.334	.040	.028	.871	.197	.250
White	.309	.101	.546	**.004**	.193	.258	.340	.031	.048	.783	.326	.062
Exp. Years of Ed.	.062	.194	.154	**.002**	.058	.178	-.011	.785	-.047	.266	.028	.510
Years of College	-.242	**.003**	-.221	**.008**	-052	.178	-.085	.182	.101	.150	-.044	.530
Parents Inc. over $80k									-.423	**.008**	.633	**.000**
Parents Coll. Grads	.659	**.000**	.330	.057								
Full Sem. HS M. Mgt.	.245	.353	.225	.423	.746	**.006**	.216	.331	-.006	.980	.688	**.002**
Full Sem. HS Econ.							.290	.041	.035	.826		
Part Sem. HS Econ.							.513	.009	.126	.563		
HS Stock Game	.079	.672	.095	.625	-.013	.940	.045	.775	-.204	.223	-.048	.768
Full Sem. Col. MMgt.	.359	.200	-.121	.093	.753	.851	.228	.337	.390	.107	-.278	.278
College Economics									.339	**.030**	.292	.062
Student Debt at Grad.	-.025	**.000**	-.017	**.001**	-.010	**.017**					-.028	**.000**
Nagelkerke R Squared	.139		.098		.031		.034		.038		.129	

Table 15
Regression on Financial Behavior Index

	B	**Sig.**
Constant	2.485	.000
Male	.140	.294
White	.407	**.002**
Expected Years of Education	.048	.129
Years of College	-.087	.113
Full Semester HS Money Mgt.	.375	**.036**
Full Semester HS Econ.	.284	**.013**
Played Stock Game in HS	-.041	.750
Full Sem. College Money Mgt.	.186	.323
Student Debt at Graduation	-.020	**.000**
Financial Literacy Score	.731	**.043**
Adjusted R Squared	.094	

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